UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: MAY 11 1990

SUBJECT: Mound Plant Operational Units 3 & 7 RI/FS Work Plan

FROM: Judy Kleiman, RCRA/CERCLA Liaison ORIGINAL SIGNED BY/ JUDY KLEIMAN

TO: Diana Mally, RPM

The Work Plan for the Remedial Investigation/Feasibility Study (RI/FS) for the Mound Plant, operational units 3 and 7, has been reviewed by RCRA for ARARs. This site is a RCRA facility which submitted a Part A and a Part B application for drum storage, incineration, and thermal treatment. The waste codes on the application include all D codes (characteristic), F001-F005 (spent solvents), F006-F009 (electroplating wastes), K044 (wastewater treatment sludges form explosives), P015 (beryllium), P029 (copper cyanide), and U208 (1,1,1,2 tetrachloroethane)

Operational unit 7 consists of 44 areas which were identified by A.T.Kearney during the RCRA facility assessment (RFA) as sites of potential releases. Some of the areas in operational unit 7 are described in the Part B application as hazardous waste management units and are known to have had RCRA waste. Other areas described in this document are not known to have had any hazardous waste, while still others are associated with mixed waste. Mixed waste is defined by RCRA as waste which is both radioactive and hazardous, but it is not clear if in this document the term "mixed waste" refers to hazardous waste or just solid waste which is radioactive. None of the individual area descriptions mention specific waste to which RCRA waste codes can be assigned, nor is there any information on releases of hazardous waste.

Operational unit 3 is described in this report as consisting of 16 areas which are not under RCRA. Although none of these areas are currently regulated by RCRA, some of these areas did contain RCRA hazardous waste, either before the effective date of RCRA or as temporary storage areas. RCRA waste disposed of prior to the effective date of RCRA may still be subject to RCRA ARARs if the waste is now excavated and placed or treated.

In order to identify RCRA ARARs, it is necessary to first establish the presence of hazardous waste. The presence of hazardous constituents in the area is not sufficient. The RI should collect as much information as possible on specific RCRA hazardous wastes managed at each area in operational units 7 and 3. In areas described as solvent storage areas, the solvents must be specified in order to determine what if any RCRA waste code would apply. excavated and placed or treated.

If you have any questions on this matter, please contact me at 886-1482.

cc: Karl Bremer

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
40 South Main Street
Dayton, Ohio 45402-2086
(513) 449-6357
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Richard F. Celeste
Governor

August 18, 1989

Re: Negotiated Feasibility Study
Statement of Work

Art Kleinrath
U.S. EPA Region V 5HS-11
Hazardous Waste Enforcement Branch
230 South Dearborn Street
Chicago, Illinois, 60604

Mr. Kleinrath:

Enclosed you will find for your review and concurrence the Statement of Work (SOW) for the U.S. DOE Mound Plant Feasibility Study (FS) which was negotiated by DOE, U.S. EPA and OEPA at the August 15, 1989 FFA negotiations meeting. You are being provided with a hard copy and a version on diskette. An identical package has been forwarded to DOE.

All modifications agreed to by the parties have been incorporated with one exception which is discussed below. Additions have been underlined ; deleted text has been struck-out. Additionally, as U.S. EPA requested, "Respondents" has been replaced with "DOE", and "contaminants" has been replaced with "hazardous substances, pollutants or contaminants" throughout the document. A previously unnoticed redundancy ("U.S. EPA and OEPA guidance") which appeared in 11.2 has been corrected.

The exception noted above appears in 11.5 under "Ground Water Alternatives". U.S. EPA, supported by DOE, wished to change the phrase "risk based levels" to "health based levels". OEPA central office staff maintains that the term "risk" is to be reinserted as originally drafted. This is the only difference between the enclosed SOW and the SOW agreed to at the August 15 meeting.

OEPA finds the enclosed version of the Mound FS SOW to be acceptable. Please respond with U.S. EPA's position regarding this document at your earliest convenience.

Sincerely,

Bob Princic

Bob Princic
Corrective Actions

cc: Maury Walsh, Deputy Director/CO
Jenny Tiell, DERR/CO
Dave Mentzer, DERR/CO
Don Vanterpool, Legal/CO
Jack Van Kley, AGO
U.S. DOE, Mound Plant
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Richard F. Celeste
Governor

July 14, 1989

Re: OEPA draft Feasibility Study
Statement of Work

Art Kleinrath
U.S. EPA Region V 5HS-11
Hazardous Waste Enforcement Branch
230 South Dearborn Street
Chicago, Illinois, 60604

Mr. Kleinrath:

Enclosed you will find for your review and comment OEPA's redraft of the Statement of Work (SOW) for the U.S. DOE Mound plant Feasibility Study (FS). As we discussed over the phone on July 13, 1989, the SOW for the Remedial Investigation (RI) is proving to be more difficult to revise in a manner consistent with current CERCLA guidance.

One of the difficulties we have encountered is the existing segregation of the RI and the FS into two separate statements of work. One SOW for the RI and another SOW for the FS makes incorporation of current RI/FS guidance more difficult as the iterative and interdependent nature of the RI/FS process does not readily lend itself to a separate SOW format. The enclosed redraft of the FS SOW, while titled as though it is a separate document, is formatted in such a manner as to facilitate incorporation into a single RI/FS SOW should U.S. EPA and U.S. DOE so desire.

We hope to be able to forward the revised RI SOW to you on or before July 21. If you have any questions regarding the enclosed FS SOW, please feel free to contact me at (513) 449-6357.

Sincerely,

Bob Princic

Bob Princic
Corrective Actions

cc: Jenny Tiell, DCA/CO
Dave Mentzer, OCA/CO
Don Vanterpool, Legal/CO
Jack Van Kley, AGO
U.S. DOE, Mound Plant
U.S. DOE, Los Alamos, NM

SCOPE OF WORK FOR A FEASIBILITY STUDY AT DOE MOUND PLANT

10.0 PURPOSE

The purpose of the Feasibility Study(s) is to develop and evaluate remedial action alternatives for each interim or final remedial action and/or identified operable unit in order to recommend those alternative(s) which will effectively mitigate actual or potential threat(s) to human health, welfare or the environment resulting from the release or potential release of contaminants at or originating from Mound. The FS shall adhere to the processes and terminology identified in the U.S. EPA document "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA", October, 1988 as amended (RI/FS Guidance).

11.0 IDENTIFICATION AND DEVELOPMENT OF REMEDIAL ALTERNATIVES

Based on the results of the Remedial Investigation (RI), consideration of the Preliminary Remedial Technologies identified as part of the RI, and identified Federal ARARs and State law requirements, the Respondents shall identify, screen and develop remedial alternatives for removal, containment, treatment and/or other remediation of identified contamination. The list of Preliminary Remedial Technologies identified during the RI scoping process will likely be modified based on the results of the RI.

11.1 Description of Current Situation

Respondents shall revise the information describing the current situation at Mound and the known nature and extent of contamination based on the results of the RI. Respondents shall also update the information presented in the RI regarding previous response activities and any interim remedial actions which have been or are being implemented.

11.2 Statement of Purpose and Establishment of Remedial Action Objectives and General Response Actions

Based on the results of the RI report and in conjunction with U.S. EPA and OEPA, Respondents shall develop a specific statement of purpose which shall include identification of remedial action

objectives. Remedial action objectives shall address specific contaminants and media of interest, actual and potential exposure pathways, and preliminary remediation goals so as to permit a range of treatment and containment alternatives to be developed. The objectives shall be based on public health and environmental criteria, U.S EPA and OEPA guidance and practices, the National Contingency Plan (NCP), U.S. and OEPA interim guidance, and the requirements of any other applicable U.S. EPA, OEPA, Federal and State environmental standards, guidance and advisories as defined under SARA, Section 121 and State law. Respondents shall then further develop the general response actions identified during project scoping to ensure that they satisfy the remedial action objectives. All response actions concerning contaminant releases to ground water from RCRA regulated units must at a minimum be consistent with and as stringent as those required under 40 CFR 264.100. and OAC 264.100.

11.3 Initial Screening of Preliminary Remedial Technologies

Respondents shall review the results of the RI and further develop the list of remedial technologies and process options identified during project scoping in order to incorporate any additional technologies which are applicable to site problems. Both on-site and off-site remedial technologies are to be included as appropriate.

Respondents shall screen the revised list of preliminary remedial technologies based on technical implementability, using site and waste characteristics as the screening criteria. Technologies that prove extremely difficult to implement, require unreasonable time periods, or rely on insufficiently developed technology are to be eliminated. Emerging technologies which may have application to site problems are to be carried through the screening process if there is a reasonable belief that the technologies offer significant advantages. Respondents shall document the reasons for excluding or carrying forward technology types. A technical memorandum containing the results of the initial screening of technologies shall be submitted to U.S. EPA and OEPA for review and approval before proceeding with the alternatives development process.

This initial screening process shall focus on eliminating those technologies which have severe limitations for a given set of waste and site specific conditions. Site, contaminant, waste, and technology characteristics used to screen inappropriate technologies are described in more detail below:

11.3.1 Site Characteristics

Site characteristics shall be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics shall be eliminated from further consideration.

11.3.2 Waste Characteristics

Waste characteristics that limit the implementability of a given technology shall be identified. Areas and volumes of contaminated media as identified in the RI shall be refined as necessary and used in the initial screening. The areas and volumes are to be defined by risk levels or contaminant concentrations depending on the nature of the contaminants. Technologies whose use is clearly limited by waste characteristics are to be eliminated from further consideration.

11.3.3 Technology Limitations

Respondents shall identify the level of technology development, performance record, and inherent construction, operation, and maintenance problems for each technology being considered. Technologies that are unreliable or perform poorly are to be eliminated from further consideration.

11.4 Screening of Technology Process Options

Upon approval by U.S. EPA and OEPA of the technical memorandum identified in 11.3 above, Respondents shall screen the process options associated with the surviving technology types based on effectiveness, implementability and cost effectiveness. Respondents shall submit a technical memorandum containing the results of the process options screening to U.S. EPA and OEPA for review and approval before proceeding with the alternatives development process. The screening criteria to be used in the evaluation of process options are further defined below:

11.4.1 Effectiveness

Respondents shall evaluate: (1) the potential effectiveness of the process options in handling the estimated areas or volumes of contaminated media and meeting the remediation goals identified in the remedial action objectives; (2) the potential impact to human health and the environment during the construction and implementation phase; and (3) the degree to which the process options are proven and reliable with respect to the contaminants and site conditions.

11.4.2 Implementability

Respondents shall evaluate both the technical and administrative feasibility of implementing each one of the technology options. As the technical implementability has been previously considered during the preliminary screening of technology types (11.3 above), this more detailed evaluation shall place greater emphasis on the institutional aspects of implementability such as the ability to obtain required permits, availability of treatment storage and disposal services (including capacity), and the

availability of necessary equipment and skilled workers necessary to implement the process option.

11.4.3 Cost

Respondents shall evaluate the costs of the various process options within a given technology type. The evaluation shall recognize that costs play a limited role at this point in the screening process. Relative capital and O&M costs are to be used as opposed to detailed cost estimates. The cost evaluation shall be made based on best engineering judgment, with each process option evaluated as to whether costs are high, low, or medium relative to other process options within the same technology type.

11.5 Development and Preservation of Remedial Alternatives

Respondents shall assemble ranges of alternatives for the site as a whole and for each operable unit using the general response actions and process options chosen to represent the various technology types for each media and operable unit. Alternatives shall be developed for each of two broad categories of remedial actions: source control actions, and ground water actions. Appropriate ranges of alternatives for each of these categories are further described below:

Source Control Alternatives

Respondents shall develop a number of treatment alternatives ranging from one that would eliminate the need for long-term management (including monitoring) at the site to one that would employ treatment as a primary component of an alternative to address the principal threats at the site. Alternatives developed within this range will differ in the type and extent of treatment used and the management requirements of treatment residuals or untreated wastes.

One or more alternatives shall be developed that involve containment of waste with little or no treatment but protect human health and the environment by preventing exposure and/or reducing the mobility the contaminants.

Ground Water Alternatives

Respondents shall develop alternatives for contaminated ground water restoration which address not only cleanup levels but also the time frame within which the ground water restoration might be achieved. Alternatives are to be developed which achieve a maximum life-time risk of 10E-4 to 10E-7 for carcinogens and a hazard index of less than 1 for non-carcinogens within varying time frames using different methodologies. For aquifers currently being used as a drinking water source, at least one alternative is to be developed which achieves Federal ARARs and State

law requirements and risk based levels as rapidly as possible. Where feasible, one alternative shall be developed that would restore ground water to a 10E-6 maximum lifetime cancer risk level and a hazard index of less than 1 within five years.

11.5.1 Initial Screening of Alternatives

Following the development of alternatives, Respondents shall evaluate each alternative against the short- and long-term aspects of three broad criteria: effectiveness, implementability, and cost. The purpose of the screening evaluation shall be to reduce the number of alternatives that will undergo detailed analysis while preserving a range of treatment and containment technologies from the list initially developed. Evaluation criteria for the initial screening of alternatives are further described below:

1. Effectiveness

Each alternative shall be evaluated as to its effectiveness in providing protection to human health and the environment and the reductions in toxicity, mobility, or volume that it will achieve. Both the short-term (during construction and implementation) and the long-term (period after the remedial action is completed) components of effectiveness shall be evaluated.

2. Implementability

Each alternative shall be evaluated for both the technical and administrative feasibility of constructing, operating and maintaining the alternative. Technical feasibility refers to the ability to construct, reliably operate, and meet technology-specific regulations for process options until the remedial action is complete; it also includes operation, maintenance, replacement, and monitoring of the technical components of the alternative. Administrative feasibility refers to the ability to obtain regulatory approvals as necessary, availability of treatment, storage, and disposal services and capacities, and the requirements for and availability of, specific equipment and technical specialists.

3. Cost

The focus of the cost evaluation shall be to make comparative estimates of alternatives with relative accuracy so that cost decisions between alternatives will be sustained as the accuracy of cost estimates improves beyond the initial screening process. Both capital and O&M costs shall be considered. The evaluation shall include those O&M costs that will be incurred for as long as necessary, even after the initial remedial action is complete. Present worth analyses shall be used to evaluate expenditures that occur over different time periods. All costs shall also be discounted to a common base year so alternatives can be compared

on the basis of a single figure for each alternative. Respondents shall rely on U.S. EPA's Cost Compendium for Remedial Actions for those technologies covered by the compendium. Respondents shall document sources of cost information used for those technologies which are not covered by the compendium.

11.5.2 Alternatives Array Document

For purposes of soliciting Federal ARARs and State requirements, Respondents shall prepare an Alternatives Array Document containing a detailed description of each alternative surviving the initial screening including extent of remediation, contaminant levels to be achieved, and methods of treatment used. The Alternatives Array Document shall also include a brief history and site background, and a site characterization indicating contaminants, pathways, receptors and other pertinent site features. The decision making process employed in the initial screening shall be fully documented. The Alternatives Array Document shall be submitted to U.S. EPA and OEPA for review and approval and U.S. EPA shall respond with ARARs and OEPA shall respond with State requirements prior to proceeding with the detailed screening of alternatives.

11.6 Post-Screening Phase

To ensure a smooth transition from the screening of alternatives to the detailed analysis, Respondents shall identify and begin verifying action-specific Federal ARARs and State requirements and initiate treatability testing for those process options that will require additional data for detailed analysis. Additional site characterization work for purposes of better defining the effect of site conditions on the performance of the technologies of greatest interest shall be undertaken as appropriate.

11.6.1 Bench and Pilot Scale Studies

1. Respondents may propose bench and pilot scale studies. U.S. EPA and OEPA shall determine the need for such studies.

2. If the need for bench and pilot scale studies has been determined, Respondents shall prepare a work plan to be submitted to U.S. EPA and OEPA for review and approval, based on the suggested format for bench and pilot scale work plans (Tables 5-5 and 5-6) identified in the RI/FS Guidance. The work plan shall contain adequate quality assurance and quality control procedures for conducting the studies and employ uniform testing procedures established by U.S. EPA. The studies shall be conducted and documented in such a manner as to facilitate use of the information when conducting similar studies at other sites (see Chapter 5 of the RI/FS Guidance).

11.6.2 Post-Screening Field Investigation

1. Respondents may propose additional field studies for purposes of refining site characterization. U.S. EPA and OEPA shall determine the need for such studies.

2. If the need for additional field studies has been determined, Respondents shall prepare a work plan for these studies to be submitted to U.S. EPA and OEPA for review and approval. Additional quality assurance and quality control procedures and additional health and safety requirements shall be identified in the work plan as appropriate.

11.6.3 Refine Remedial Action Objectives

Respondents shall refine the medium- and operable unit-specific Remedial Action Objectives developed during project scoping based on the initial screening of alternatives (11.5 above) and any new information obtained from additional studies (11.6 above). At this point in the process, the Remedial Action Objectives are to be as specific as possible.

12.0 DETAILED ANALYSIS OF ALTERNATIVES

Respondents shall conduct a detailed analysis of the alternatives remaining after the initial screening as documented in the approved Alternatives Array Document. Respondents shall identify and describe Federal ARARs, State requirements, and other criteria, advisories and guidance to be used in the analysis and selection of remedy(s). Alternatives shall be analyzed in sufficient detail so as to allow selection of remedy(s) from a set of defined and discrete hazardous waste management approaches.

Respondents shall develop and use the information necessary to evaluate each alternative. The specific statutory requirements for remedial actions that must be addressed in each ROD and supported in each FS report are listed below. Remedial actions must:

- Be protective of human health and the environment;
- Attain Federal ARARs and State requirements (or provide grounds for invoking the appropriate waiver);
- Be cost effective;
- Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and

- Satisfy the preference for treatment that reduces toxicity, mobility, or volume as a principal element or provide an explanation in the ROD as to why it does not.

In addition, CERCLA places an emphasis on evaluating the long-term effectiveness and related considerations for each of the alternative remedial actions (Section 121(b)(1)(a)). These statutory considerations include:

(A) the long-term uncertainties associated with land disposal;

(B) the goals, objectives, and requirements of the Solid Waste Disposal Act;

(C) the persistence, toxicity, and mobility of hazardous substances and their constituents, and their propensity to bioaccumulate;

(D) short- and long-term potential for adverse health effects from human exposure;

(E) long-term maintenance costs;

(F) the potential for future remedial action costs if the alternative remedial action in question were to fail; and

(G) the potential threat to human health and the environment associated with excavation, transportation, and redisposal, or containment.

12.1 Application of the Nine Criteria and Document Analysis

Respondents shall perform a detailed analysis of the alternatives surviving the initial screening in order to provide the basis for identifying the preferred alternative and preparing the Proposed Plan. The analysis shall evaluate each alternative in detail using the nine evaluation criteria listed below, incorporating any treatability study data and additional site characterization data that may have been collected during the RI.

1. **Overall Protection of Human Health and the Environment** addresses whether or not each alternative provides adequate protection and describes how the risks posed by each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with Federal ARARs and State Requirements** addresses whether or not each alternative will meet all of the applicable or relevant and appropriate requirements of other Federal environmental laws and/or provide grounds for invoking a waiver, and whether or not a remedy will meet State law requirements.

3. **Long-term Effectiveness and Permanence** refers to the ability of each alternative to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

4. **Reduction of Toxicity, Mobility, and/or Volume Through Treatment** is the anticipated performance of the treatment technologies each alternative may employ.

5. **Short-term Effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals have been met.

6. **Implementability** is the technical and administrative feasibility of each alternative, including the availability of materials and services needed to implement a particular option.

7. **Cost** includes estimated capital and operation and maintenance costs, and net present worth costs.

8. **State Acceptance** addresses the technical and administrative issues and concerns OEPA may have regarding each alternative.

9. **Community Acceptance** addresses the issues and concerns the public may have regarding each alternative.

Respondents shall refer to Chapter 6 of the RI/FS Guidance for further definition of the above nine criteria and the processes employed during the detailed analysis of alternatives.

(Note: Criteria 9 is to be incorporated into the FS as the Responsiveness Summary after the RI/FS has been released to the public.)

12.2 Presentation of Individual Analyses

For each alternative, Respondents shall provide: 1) a description of the alternative which details the waste management strategy involved and identifies associated Federal ARARs and State requirements, and 2) a narrative discussion of the application of each of the evaluation criteria, and 3) a comparison of the alternative to each of the other alternatives with respect to the evaluation criteria identified in 13.1 above. Respondents shall submit the detailed alternative descriptions, and the results of the detailed analysis and comparison of alternatives as a Technical Memorandum to U.S. EPA and OEPA for review, and approval.

Following regulatory approval of the submittal discussed above, Respondents shall incorporate the detailed analysis and

comparison of individual alternatives into the draft FS report as a narrative discussion accompanied by a summary table.

13.0 ENDANGERMENT ASSESSMENT

Respondents shall conduct an Endangerment Assessment (EA) which evaluates the collective demographic, geographic, physical, radiological, chemical and biological factors to determine whether there is a significant risk to public health or the environment as a result of a threatened or actual release of a hazardous substance or waste. The findings of the EA shall be summarized and included in the FS report.

Respondents shall prepare a Level III Endangerment Assessment (EA) and for the study area as a whole, and individual EAs for each of the operable units. The Level III EA shall evaluate for each receptor the total risk posed by all identified contaminant sources (i.e., the additive risks posed by each of the operable units). The level of complexity for the operable unit specific EAs will be determined following evaluation of the RI data for the specific operable unit. The EAs are to be incorporated into the appropriate FS report(s).

The EAs will build upon the information developed during the preparation of the base-line Risk Assessment(s) during the RI. The EAs shall follow U.S. EPA's "The Endangerment Assessment Handbook" (August 1985), "Superfund Public Health Evaluation Manual" (October 1986), and the "Superfund Exposure Assessment Manual" (April 1988), and shall be of sufficient detail to allow derivation of cleanup criteria for those contaminants for which such criteria does not already exist.

14.0 RESPONDENTS' RECOMMENDATION OF A REMEDIAL ALTERNATIVE

Respondents may recommend a remedial alternative to U.S. EPA and OEPA for consideration and approval. If Respondents elect to recommend a remedial alternative for regulatory consideration, Respondents' recommendation and supporting rationale shall be provided in a separate document to be submitted simultaneously with the draft FS report.

15.0 FEASIBILITY STUDY REPORT

Respondents shall present the results of 11.0 and 12.0 in the FS report. The FS report shall follow the suggested FS report format (Table 6-5) identified in the RI/FS Guidance. Support data, information, and calculations are to be included in appendixes to the report. Respondents will prepare and submit a draft FS report to U.S. EPA and OEPA for review and approval. Once comments have been received, Respondents shall prepare a

final FS report reflecting regulatory comments. Following regulatory approval of the selected remedy, U.S. EPA and OEPA will further define Federal ARARs and State requirements and other advisories and guidance to be used in remedy development and design.

JUN 14 1989

Mr. Robert T. Princic, Jr.
Ohio EPA
Southwest District Office
Dayton, Ohio 45402-2086

Dear Mr. Princic:

Enclosed is the DOE response to the April 17, 1989 OEPA review of the DOE position on the use of operable units at Mound Plant. Three main areas of concern were identified by the OEPA:

- the interchanging of the terms "operable unit" and "task";
- the proposed operable units have not been specifically or clearly identified; and
- because the proposed operable units were not clearly identified, the proposed schedule was not appropriate.

As agreed upon at the May 10, 1989 FFA meeting at Mound Plant, the DOE will use the term "operable unit" to describe specified groups of potential release sites at Mound Plant. The word "task" will no longer be used to describe these groups, however, the task descriptors which DOE uses to manage the Environmental Restoration (ER) program will continue to appear as parenthetical descriptors associated with the names of the operable units, such as Area B (AL-MD-1-1).

The decision to drop the word "task" should clarify the identification of operable units. Eight (8) proposed operable units are named as such in Attachment 1, which lists potential release sites in each operable unit. A figure is provided for each operable unit showing the potential release sites included in the unit.

The clear identification of operable units should help address the OEPA comments concerning schedules. In addition, specific comments about schedules have also been addressed and are reflected in Attachment 2.

The DOE would like to assure the OEPA that the eight (8) operable units are the only environmental concerns known at this time, but if any new areas of concern occur, the DOE intends to include these in the agreement. The language in the legal portion of the FFA/IAG supports this position.

DAO:PR:CJL

CJL 6/14

C&A-LYONS

JF 6/14

C&A-GARTRELL

6/14

AM-MORLEY

6-14

If you require additional clarification, please contact John Lyons of my staff at (513) 865-4493.

Sincerely,

ORIGINAL SIGNED BY

James A. Morley
Area Manager

Enclosures: a/s:

cc with enclosures:
Don Marshall, OEPA
Mike Starkey, OEPA
A. Kleinrath, US EPA
Dick Neff, EG&G
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George Lasker, EHD, AL
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LYONS/LUSK
LUSK
OPUNITBP

FILE CODE:
5400.13E

ATTACHMENT 1

Environmental Restoration Program Operable Units at Mound Plant

Operable unit is defined in the National Contingency Plan as "a discrete part of the entire response action that decreases a release, threat of release, or pathway of exposure" (40 CFR 300.6). It was agreed at the May 10, 1989 FFA meeting at Mound Plant to use the term operable unit with no numeric identifier. For example, "Area B Operable Unit". In addition, it was agreed that the former DOE task identification number may follow the operable unit title in parenthesis, for ease in budget-tracking by the DOE.

The Environmental Restoration (ER) Program has currently identified eight operable units at Mound Plant based on available data and historical information. These operable units are given below.

- The Area B Operable Unit (AL-MD-1-1) is addressing volatile organic chemical contamination of the Buried Valley aquifer at Mound Plant.

- The Main Hill Seeps Operable Unit (AL-MD-1-2) is addressing tritium and volatile organic chemical contamination of the indurated bedrock on the Main Hill at Mound Plant.

- The Miscellaneous Sites Operable Unit (AL-MD-2) is addressing possible hazardous constituents at potential release sites that are not currently operational, not covered by RCRA, and contain no known radioactive contamination.

- The Miami-Erie Canal Operable Unit (AL-MD-3-1) is addressing an offsite area that contains plutonium-contaminated sediments.

- The Radioactively Contaminated Soil Operable Unit (AL-MD-3-2) is addressing potential release sites at Mound Plant that have soils with known or suspected radioactive contamination.

- The Decontamination and Decommissioning (D&D) Program Sites, Hazardous Constituents Operable Unit (AL-MD-4) is addressing potential release sites at Mound Plant that contain radioactive contamination. These sites are not included in the Radioactively Contaminated Soil Operable Unit because funding is provided by the D&D Program.

- The RCRA Sites Operable Unit (AL-MD-5) is addressing potential release sites at Mound Plant that contain no radioactive contamination, may require a different technical approach that the Miscellaneous Sites Operable Unit potential release sites, and for which a different remedial action schedule and approach (such as a RCRA closure) may be used.

- The Inactive Underground Storage Tanks Operable Unit (AL-MD-6) is addressing 10 inactive underground storage tanks located throughout Mound Plant.

ER Program potential release Sites at Mound Plant

The potential release sites that are grouped in these operable units are given in the following sections.

Area B Operable Unit

Figure 1 3 potential release sites

Area 18, ditch sediment in landfill cover
Contaminated soils and pond area
Site sanitary landfill

Main Hill Seeps Operable Unit

Figure 2 1 potential release site

Main Hill seeps

Miscellaneous Sites Operable Unit

Figure 3 16 potential release sites

Building 61, former heavy equipment area
Monitoring well 34-1
Old firing range drum storage site
Paint shop
Powerhouse
Farm trash area (from previous owner)
Trash burner
Waste oil drum field
Area C, waste storage area
Area F, chromium trench
Area H, pyrotechnic waste disposal area
Area I, Buildings 1 and 27 leach pits
Area J, dredge material disposal area
Building E, solvent storage shed
Building G, garage area
Past hazardous waste storage area

Miami-Erie Canal Operable Unit

Figure 4 1 potential release site

The section of the abandoned Miami-Erie Canal adjacent to Mound Plant

Radioactively Contaminated Soil Operable Unit

Figure 5 18 potential release sites

Area 2, WD Building filter-cleaning waste & crushed, empty thorium drums
Area 3, storage and redrumming area
Area 5, radioactive waste line break
Area 6, WD Building filter-cleaning waste
Area 7, Soil from the SW cave, contaminated ventilation exhaust system, and crushed, empty thorium drums
Area 8, contaminated soil from Areas 9 and 1
Area 9, former thorium storage and redrumming area
Area 10, concrete from Unit 4 Dayton operations
Area 12, contaminated soil from Area 1 and SM Building operations
Area 13, polonium-contaminated wood from Unit 4 Dayton operations
Area 15, crane tracks and shielding from the old SW cave
Area 20, radioactive waste line break
Area 21, old bunker used for SW Building radioactive waste storage
Area 22, orphan soil transferred from other areas
The plant drainage ditch
Alpha wastewater treatment system
Beta wastewater treatment system
Cyclone incinerator

Decontamination and Decommissioning Program Sites Operable Unit

Figure 6 10 potential release sites

Area 1, bulk transfer of thorium drums
Area 4, WD Building influent tank overflow
Area 4a, sewage sludge drying pits
Area 11, contamination from SM Building operations
Area 14, radioactive waste line break
Area 16, sanitary sewage septic tank and leach basin for the SM Building
Area 17, the area under the SM Building
Area 19, the underground waste transfer line
Area D, the acid leach field
The old sanitary wastewater treatment plant

RCRA Sites Operable Unit

Figures 7 and 8 50 potential release sites

Building 27 concrete flume
Dredge spoil drying beds
Glass melter room sump
Oil burn structure
Sewage disposal building area
Sludge drying beds
Thermal treatment unit
Underground sewer lines

RCRA Sites Operable Unit continued

WD Building drum staging area
Asphalt lined pond
Building 72 storage area
Fire fighting training facility
Overflow pond
Retention basins
Spoils disposal area
Scintillation vial storage area
Building 23 solvent storage area
DS Building solvent storage area
Building B solvent storage shed
Hazardous waste storage area
Radioactive/mixed waste storage area
Drilling mud drum storage area
Building 27 solvent storage area
Building B temporary drum storage area
Test firing residual area
Strainer
Iodine absorption filter
Ventilation hoods
Retort
Building 90 blockhouse
Pyrotechnic waste shed
Biodegradation unit
Explosive waste storage bunker
Building 1 sump
Building 27 sump
Waste transport vehicles
Cooling tower basins
Glass melter feed drum
Trash dumpsters
Vapor degreaser
SW Building drum storage area
Glass melter furnace
Deluge tank
Venturi scrubber
Cyclone demister
HEPA filter
WD filter bank
Recycle tank
Leaf solution tank
Epoxy resin disposal

Inactive Underground Storage Tanks Operable Unit

Figure 9 10 potential release sites

3 tanks at SD Building
3 tanks at WD Building annex
Building 34 aviation fuel tank
Building 51 waste solvent storage tanks
Building 43 solvent storage tank
Building 27 diesel fuel tank

(Total = 109 potential release sites)

ATTACHMENT 2

Schedule

The OEPA raised several issues regarding the DOE proposed schedule for Mound Plant. In response to those issues, revised schedules for each operable unit are provided in figures 10 & 11. The schedules were modified to show an individual schedule for each operable unit. The schedules include any regulatory review time and time required for report revisions. Additional changes to the original schedule are discussed below.

The duration of the Record of Decision (ROD) for each operable unit is shown as a dashed line to indicate the maximum time period for completion of the ROD. The period extends across six months since it is anticipated that completing the ROD at some of the more complex operable units may require more time than the typical 2 to 3 months.

Feasibility Studies (FS) do overlap with portions of the Remedial Investigations (RI) in most cases. When this is not the case, the FS starts at the beginning of the subsequent fiscal year. The start of the FS is staggered behind the RI for some operable units since budget projections indicate that there will be insufficient funding to begin the FS at an earlier date.

The individual schedules have been modified so that there will be only one RI report for the RCRA Sites Operable Unit. The schedule for this operable unit was lengthened to accommodate available funding.

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
40 South Main Street
Dayton, Ohio 45402
(513) 449-6357

Richard F. Celeste
Governor

April 17, 1989

Re: U.S. DOE - MOUND FACILITY
MONTGOMERY COUNTY
CERCLA CORRESPONDENCE FILE

Mr. James Morley
Area Manager
U.S. DOE - Mound Facility
Dayton Area Office
P.O. Box 66
Miamisburg, OH 45432

Dear Mr. Morley:

Ohio EPA has completed its review of your March 3, 1989 letter which defined Mound's approach with respect to operable units being incorporated into the Remedial Investigation/Feasibility Study (RI/FS) portion of the DOE Environmental Restoration (ER) program.

Based upon OEPA review of your letter, the Agency feels that the proposed operable units have still not been specifically or clearly identified.

The synonymous use of the term task for an operable unit was very confusing, not only within Ohio EPA, but would have likely confused the general public as well.

In your March 3, 1989 letter, page 2 presented a section on the identification of operable units. In this section it stated that "the proposed operable units...were listed in Table 1, and illustrated in Figure 2" and that "the tasks were equivalent to the proposed operable units." Upon examination of Table 1 and Figure 2 in the context of that paragraph, one came to the conclusion that the site was being divided into either five (5) operable units (based on Figure 2) or seven (7) operable units (based on Table 1).

On April 12, 1989, a technical meeting was held at Mound to further discuss Federal Facility Agreement (FFA) negotiations with U.S. EPA - Region V, Ohio EPA and Mound Representatives. The purpose of the meeting was to discuss DOE ER program objectives, particularly with respect to alleviating further confusion regarding the synonymous use of the terms task and operable unit. Ohio EPA first recommended to Mound Representatives and USEPA that each task be defined to consist of a desired number of specifically defined operable units. This proposal would cause each task to represent a specific number of divisions, based upon separate releases and contaminants to be addressed for each of the identified tasks within the Mound site. Furthermore, the definition (of operable unit) will in turn be placed in the opening statement(s) of each draft and final document when applicable.

Another option which Ohio EPA recommended at the meeting was to have the term task stricken from use when referring to operable units. Mound Representatives agreed to consider this request. If the term task must be used, then Mound should follow our first recommendation above for all current and future documents.

Because the proposed operable units were not clearly identified, Figure 3 also did not make sense. For example, the schedule projected that an ROD would take considerably more time to complete than the 2-3 months which is typically required. Similarly, feasibility studies usually overlap with portions of remedial investigations and usually do not take more than 6 months to prepare. Likewise, it should not take a year to prepare a remedial investigation report, especially if the report only covers a single unit. The schedule shown in Figure 3 must be more detailed, must clearly identify proposed time lines for each operable unit and include any regulatory agency review time and time required to make needed revisions to the reports. Moreover, Ohio EPA's acceptance of DOE's proposed operable unit approach for the Mound facility RI/FS, hinges on these operable units being clearly identified while at the same time eliminating the confusing and synonymous use of the term "task" for "operable unit"

Please feel free to contact me at (513) 449-6357 if you have any questions.

Sincerely,

Marc S. Hill
Project Coordinator
Corrective Actions Group

MSH/lal

cc: Dave Mentzer, OCA/Central Office
Don Vanterpool, Legal/Central Office
Jack Van Kley, EES/AGO
Art Kleinrath, U.S. EPA, Region V

yellow

Department of Energy
Albuquerque Operations Office
Dayton Area Office
P.O. BOX 66
Miamisburg, Ohio 45342

C&A-LYONS 3/2/89

C&A-GARTR 3-2-89

AM-MORLEY 3-2-89

LYONS

MARCHILL, FILE CODE 5400.13

March 3, 1989

Mr. Marc S. Hill
Ohio EPA
Southwest District Office
Dayton, Ohio 45402-2086

Dear Mr. Hill:

We have reviewed your letter dated February 24, 1989, requesting additional detail supporting the division of environmental work at Mound Plant into operable units, defined as tasks within the Environmental Restoration Program. The following information is provided to define the technical and logistical reasons supporting this approach, and to show that it is fully supported by federal regulation.

The current National Contingency Plan (NCP) explicitly allows the use of the operable units approach with the Remedial Project Manager's approval. The criteria for implementing operable units is whether implementation is cost effective and consistent with a permanent remedy (40 CFR 300.68(c)(3)). In addition, the newly proposed NCP (53 FR 51394) expands on the use of operable units.

An operable unit is defined as ". . . a discrete action that comprises an incremental step toward comprehensively addressing site problems" (53 FR 51477). The proposed NCP includes a "bias for action" which explicitly encourages the use of operable units (53 FR 51423). The Superfund Program has long permitted the use of operable units, and recognizes that when problems are "reasonably severable" the phasing allowed by the use of operable units may promote more rapid risk reduction (53 FR 51423). It is our judgement that the proposed operable units at Mound Plant are reasonably severable, and it is our intent to use operable units to promote a more rapid risk reduction.

The routine use of operable units for Superfund sites is also very clear in the precedent provided by Records of Decision (RODs) and the completion of Federal Facilities Agreements (FFAs). The first ROD ever signed was an operable unit ROD for Nashua, New Hampshire. Nationwide approximately 60% of all RODs signed in 1988 were operable unit RODs, and the remaining single-unit RODs were for extremely simple sites. The Mound Plant is a complex site, and the use of multiple operable units would be both appropriate and consistent with the proposed NCP's guidance for complex sites.

Approximately 9 FFAs have been completed or are imminent: these include between 2 and 20 operable units, with multiple solid waste management units (SWMUs) incorporated into each operable unit. The FFA for the Hanford, Washington, facility should be finalized shortly and will include 79 operable units. The technical and logistical considerations that led to the division of Mound Plant into operable units are explained below.

The long-range schedule and budget planning for the Mound Plant is dictated by Congressional funding. The DOE provides input to Congress on prioritizing remedial investigations/feasibility studies (RI/FSs) and remedial designs/remedial actions (RD/RAs) for all of its facilities across the country (Figure 1), and Congress distributes a limited funding base. The Mound Plant has a fixed budget ceiling for environmental restoration in each fiscal year, and is specifically prohibited by Congress from using operational funds to augment approved environmental programs funding.

The technical reasons that support the operable units approach have been considered in long-range planning for the Mound Plant. For obvious reasons, the logistics of the RI/FS and the subsequent RD/RA must take into account the technical characteristics of the Mound Plant.

Regardless of the proposed division into operable units, the Mound Plant has been and will be addressed in a comprehensive manner. The division into operable units will in no way hinder a practical, complete assessment and remediation (if needed) of the Mound Plant, specifically including contaminated groundwater. Source control will probably be most effective if multiple operable units are used; however, it is our expectation that groundwater will be remediated by addressing the combined effects of individual operable units.

Identification of Operable Units

The proposed operable units, including the SWMUs to be included in each operable unit, are listed in Table 1, and illustrated in Figure 2. The tasks are equivalent to the proposed operable units. The units consist of areas with a range of potential contaminants, including several radionuclides, metals, volatile and semivolatile organic chemicals, pesticides, and PCBs. Not all of these contaminants are suspected at each operable unit (Table 2).

Justification for Operable Units

The specific differences between the proposed operable units are the type of contamination that is suspected including whether radioactive contamination is present (Table 2), whether CERCLA or RCRA has been the main regulatory concern (Table 2), the location of the unit, and the potential threat to public health and the environment. Each of these criteria has been used to define and prioritize the proposed operable units. These criteria are consistent with those spelled out in the proposed NCP.

Task 3, Radioactively Contaminated Soils, includes all SWMUs known to contain radioactive contamination that are not part of the DOE Decontamination & Decommissioning (D&D) Program. All of the radioactive contamination within the Mound Plant boundaries has already been characterized in a comprehensive manner, but potential contamination by hazardous constituents is still to be assessed. The task includes one area outside of the Mound Plant boundaries, the Miami-Erie Canal (Task 3-1).

Task 4, D&D Sites, includes radioactively contaminated SWMUs that are part of the DOE D&D Program. This unit has been separated from Task 3 because funding is provided separately by the D&D Program, and therefore the task must follow a separate schedule from the Task 3. Some of the SWMUs have already been remediated for radioactive contamination, dictating a different technical approach than for the unremediated Task 3 SWMUs.

Task 5, RCRA Sites, includes SWMUs that are currently operational. These sites are not radioactively contaminated, and were separated from the Task 2 Miscellaneous Sites because the operational status indicated that a different technical approach might be used, and because a different remedial action schedule and approach (e.g. RCRA closure) may be used.

Schedule

As discussed previously, the proposed operable units are generally physically separate and chemically different (i.e., different potential contaminants), and will require different technologies for investigation, feasibility engineering (bench and pilot studies) and remediation. These different technologies, especially for remediation, will require varying lengths of time to complete. In order to optimize cleanup with respect to schedule and cost, different operable units will be assessed and remediated on different schedules. The schedules have been coordinated so that anticipated remedies will not conflict. The proposed real-time schedule for RI/FS and the subsequent RD/RA is presented in Figure 3.

Summary

The DOE is committed to conducting investigations and implementing remedies, if necessary, at all of its facilities across the country. The fulfillment of that commitment is limited by the funding available in any year, therefore, DOE has prioritized its sites on a nationwide basis. Mound Plant will have a finite funding resource in any given year; and cannot implement actions above the level permitted by that resource, as stated by law (the Antideficiency Act). The available funding to the Mound Plant has been and should be prioritized and distributed to the areas of greatest concern, that is, on an operable units basis.

It is the DOE's goal to complete all necessary remediation in the shortest time possible, consistent with available funding. This goal can best be met by optimizing available funding, that is, by ensuring cost-effectiveness consistent with the NCP (current and proposed) direction on operable units. Remediation will be prioritized to phase it in the order that will expedite reduction of potential risk to human health and the environment. These objectives are best addressed by using the operable units approach.

We realize that a written response may not be able to be prepared in time for the March 9th IAG meeting, but we are requesting a written response be sent to this office after your review of this letter has been completed.

If you require clarification or additional detail concerning any of the above discussion, please contact me or John Lyons of my staff on 513 865-4493.

Sincerely,

James A. Morley

James A. Morley
Area Manager

Enclosures as stated:

cc with att:
Don Marshall, OEPA
Mike Starkey, OEPA
Neff, EG&G

Table 1 SWMUs and other Potential Release Sites identified in the RCRA Facility Assessment for Mound Plant

KEY

AL-MD-1-1: DOE Environmental Restoration Program task number

[LF-1]: RCRA Facility Assessment SWMU designation (alphanumeric)

[A]: RCRA Facility Assessment designation for other Potential Release Sites

SITE

AL-MD-1-1, Area B

[LF-2]	Contaminated Soils and Pond Area, Past Landfill
[LF-1]	Site Sanitary Landfill
[SI-2]	Overflow Pond
Area 18	Sanitary sewage sludge used for landfill cover

AL-MD-1-2, Main Hill Seeps

SW Building	
[G]	Hillside Hole, Seep S001
[D]	North Slope Springs, Seep S007 and others

AL-MD-2, Miscellaneous Sites

[MI-6]		Area C, Lithium Carbonate Disposal Area
[SI-4]		Area I, Bldg 1 Leach Pit
[SI-5]		Area I, Bldg 27 Leach Pit
[LF-4]	[SI-6]	Area J
[MI-7]		Area F
[LF-5]		South Property Dump
[N]		Paint Shop
[O]		Powerhouse
[P]		Building G
[Q]		Building 61
[CS-2]		Building E Solvent Storage Shed
[CS-6]		Waste Oil Drumfield
[CS-10]		Old Firing Range Drum Storage Area
[MI-13]		Monitoring Well 34-1
[OB-1]		Trash Burner
[OB-8]		Area H

AL-MD-3-1, Miami-Erie

[I] [J] [K] [L]	Miami-Erie Canal
[B]	Runoff Hollow

Table 1 (continued)

AL-MD-3-2, Radioactively Contaminated Soils

Area 2	Crushed empty thorium drums
[CC]	Area 2, WD Building filter cleaning waste
[T]	Area 3, storage and redrumming area
[Z]	Area 5, radioactive waste line break
[DD]	Area 6, WD Building filter cleaning waste
[KK]	Area 7, soil from SW cave, contaminated ventilation exhaust system, crushed empty thorium drums
[EE]	Area 8, contaminated soils from Area 9 and 1
[W]	Area 9, thorium storage and redrumming area
[FF]	Area 10, concrete from unit 4 Dayton operations
[GG]	Area 12, contaminated soil from Area 1, SM building operations
[HH]	Area 13, polonium contaminated wood from unit 4 Dayton operations
Area 15	Crane tracks, shielding from old SW cave
[R] [BB]	Area 20, radioactive waste line break
[LL]	Area 21, old bunker used for radioactive SW Building waste storage
[II]	Area 22, Orphan Soil
[E]	Waste Pipeline
[MI-1]	Plant Drainage Ditch

AL-MD-4, D&D Sites

[S]	Area 1, bulk transfer of thorium from drums
[A]	Area 1 (Bldg 21)
[U]	Area 4, WD building influent tanks overflow
[WD-1]	Alpha Wastewater Influent Tanks
[V]	Area 4A, sewage sludge drying pits
[JJ]	Area 11, contamination from the SM Building operations
[AA]	Area 14, radioactive waste line break
[Y]	Valley-2, area related to Area 14
[C]	Area 16, sanitary sewage septic tank and leach basin for the SM Building
[X]	Area 17, area under the SM Building
[MI-2]	Area 19, underground waste transfer line
[MI-11]	Area D, acid leach field

AL-MD-5, RCRA Sites

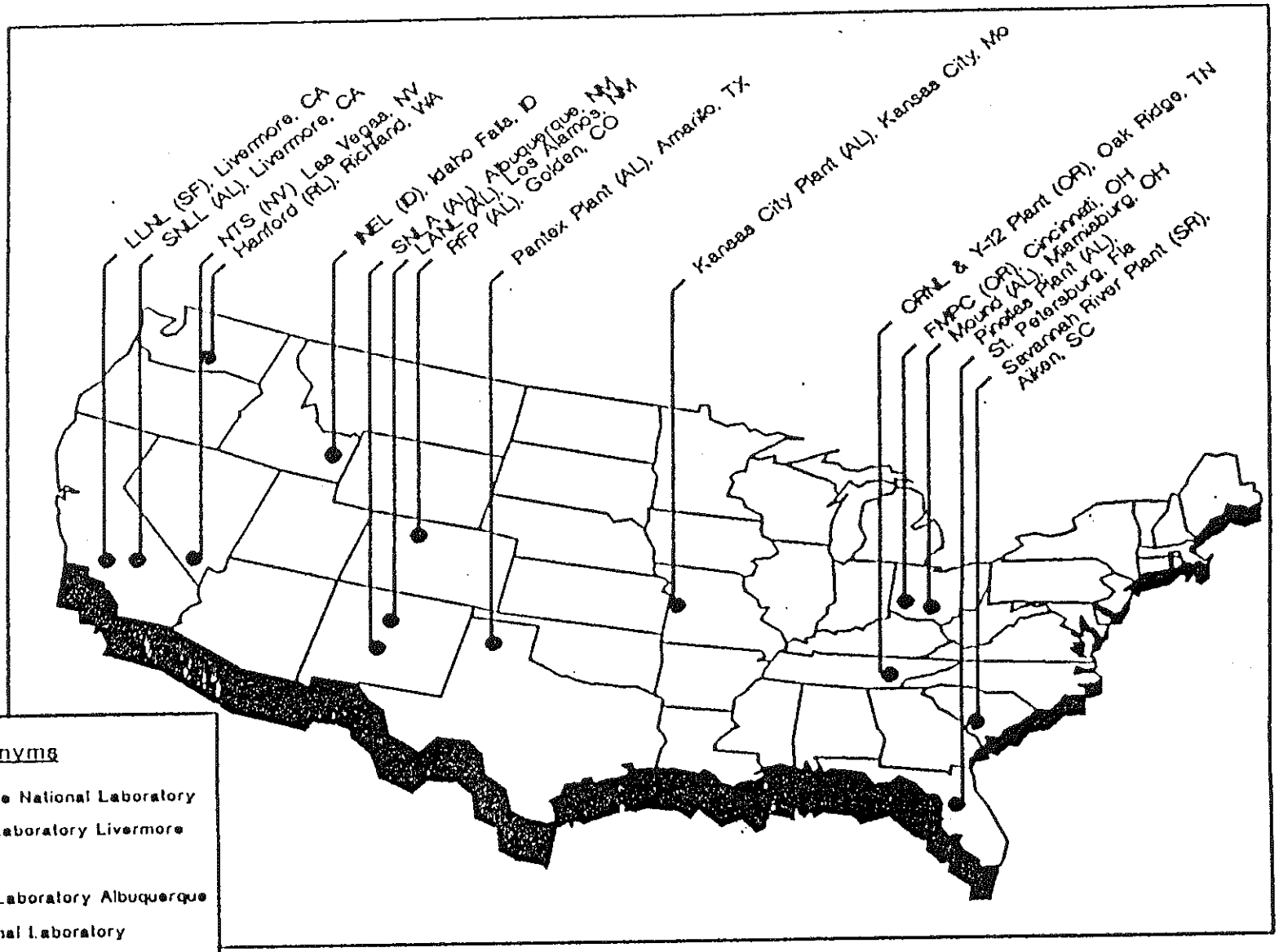
[SD-1 through SD-8]	SD Building Area
[SD-9]	Sludge Drying Beds
[SD-10]	Underground Sewer Lines
[MI-3]	Oil Burn Structure
[MI-5]	Fire Fighting Training Facility
[MI-15]	Dredge Spoil Drying Beds
[MI-14]	Building 27 Concrete Flume
[CS-16]	Cooling Tower Drum Storage Area
[CS-18]	WD Building Drum Staging Area
[OB-2]	Thermal Treatment Unit
[SU-1]	Glass Melter Room Sump
[SI-1]	Retention Basins
[SI-3]	Asphalt Lined Pond
[CS-13]	Outdoor Hazardous Waste Storage Area
[CS-14]	Empty Drum Storage Area
[UT-1]	Waste Solvent Storage Tank
[UT-2]	Aviation Fuel Tank

Table 2

FFA - Scope of Work

Task	RCRA	CERCLA	Radioactivity	Hazardous Constituent
AL-MD-1 Area B, Main Hill Seeps (Groundwater)	no	yes	Trilium	Chlorinated VOCs
AL-MD-2 Miscellaneous Soils	?	yes	Minimal, if any	none known
AL-MD-3 Radioactively contaminated soil area from site survey report	?	yes	Plutonium isotopes Thorium isotopes other radionuclides	none known
AL-MD-4 Radioactively contaminated soils associated with processing buildings, under remediation by D&D Program for radionuclides only	?	yes	Plutonium isotopes other radionuclides	none known
AL-MD-5 Potential RCRA 3004(u) and operational sites	yes	yes	Minimal, if any	none known

Figure 1



Acronyms

LLNL – Larence Livermore National Laboratory
SNLL – Sandia National Laboratory Livermore
NTS – Nevada Test Site
SNLA – Sandia National Laboratory Albuquerque
LANL – Los Almos National Laboratory
INEL – Idaho National Engineering Laboratory
RFP – Rocky Flats Plant
ORNL – Oak Ridge National Laboratory
FMPC – Feed Materials Production Center

Environmental Restoration Program DOE/DP Locations

Figure 2

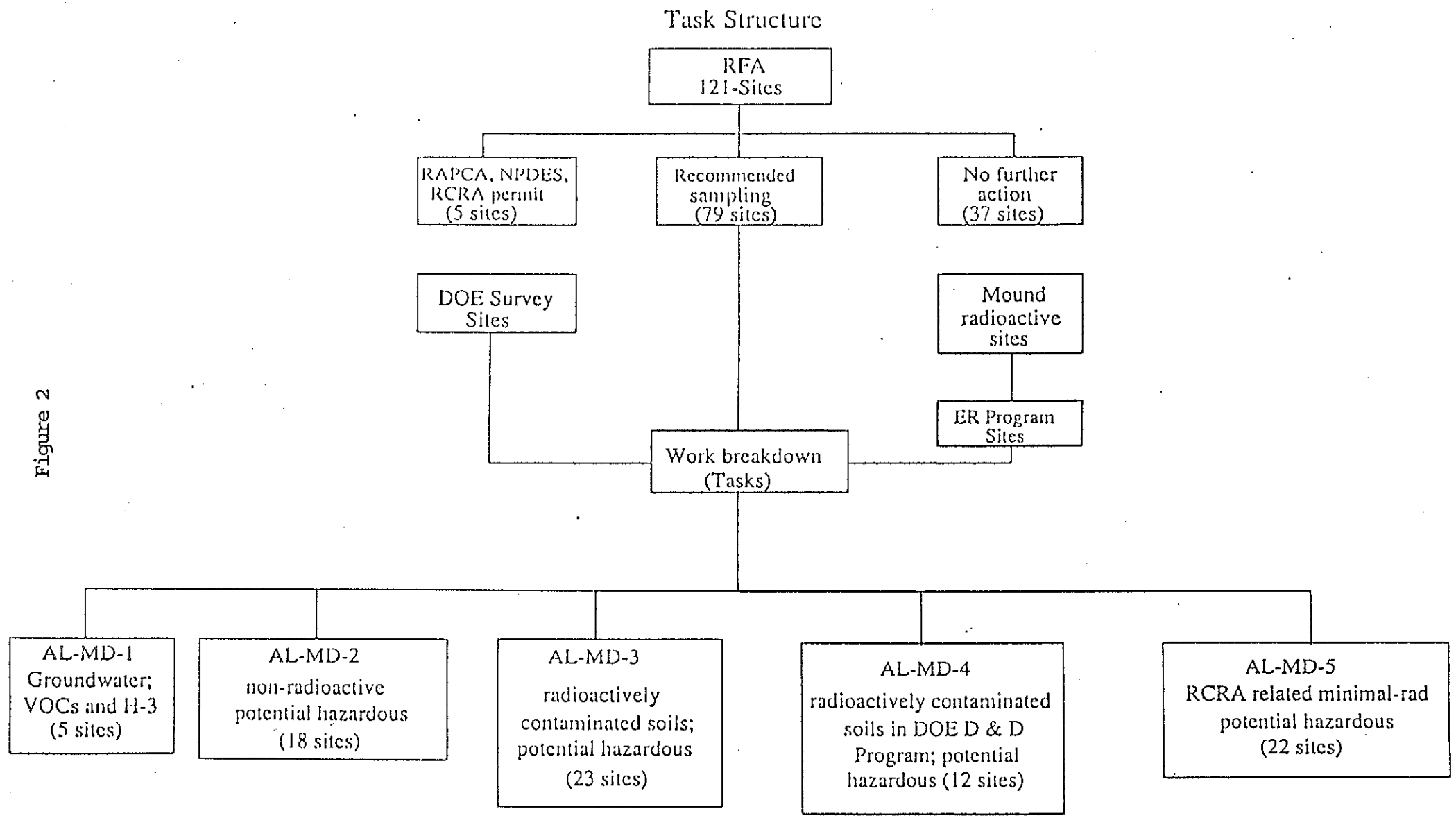
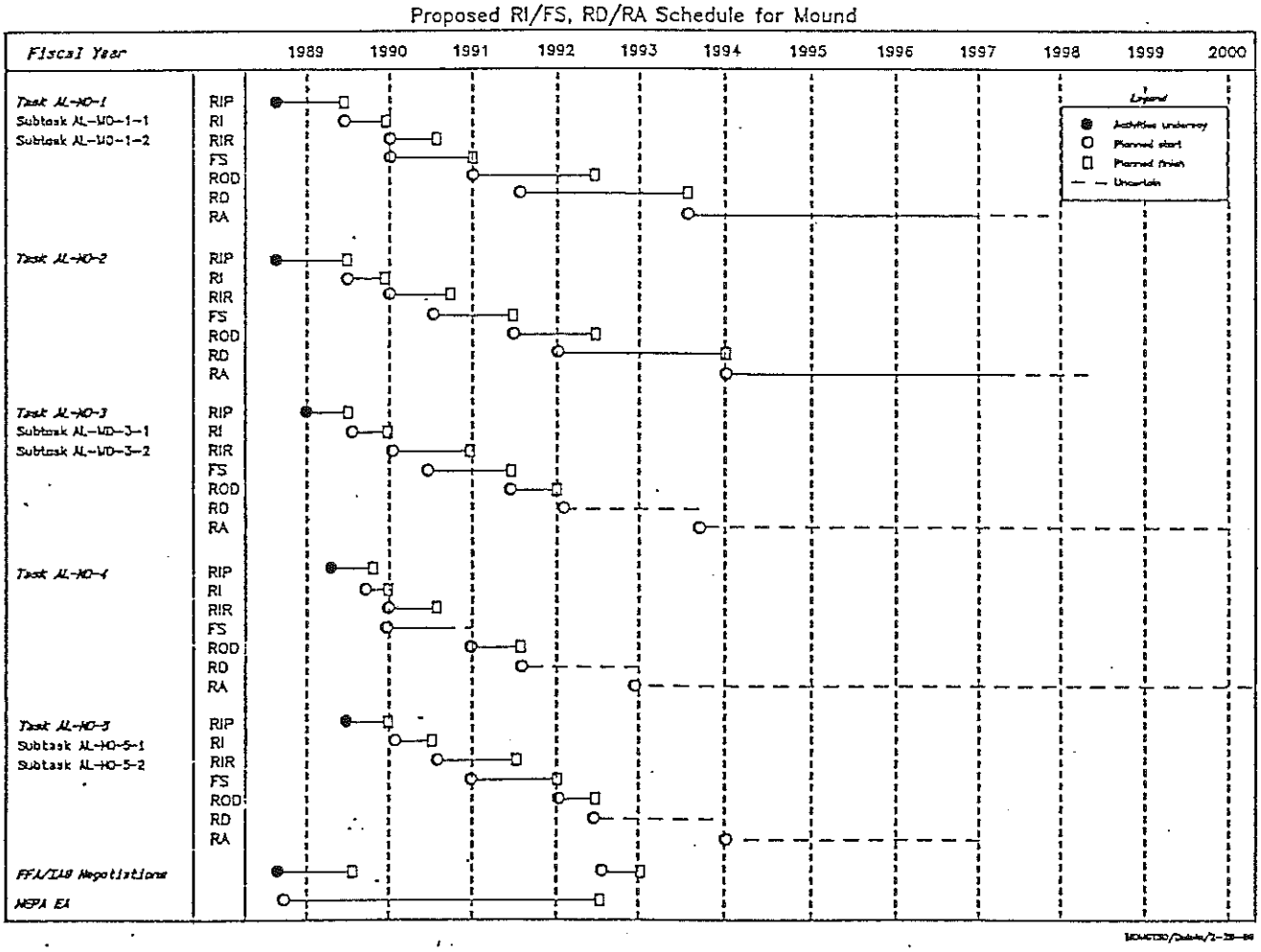

Task Structure
RFA
121-Sites
RAPCA, NPDES, RCRA permit (5 sites)
Recommended sampling (79 sites)
No further action (37 sites)
DOE Survey Sites
Mound radioactive sites
ER Program Sites
Work breakdown (Tasks)
AL-MD-1
Groundwater; VOCs and H-3
(5 sites)
AL-MD-2
non-radioactive potential hazardous
(18 sites)
AL-MD-3
radioactively contaminated soils; potential hazardous
(23 sites)
AL-MD-4
radioactively contaminated soils in DOE D & D Program; potential hazardous (12 sites)
AL-MD-5
RCRA related minimal-rad potential hazardous
(22 sites)

Figure 3


Proposed RI/FS, RD/RA Schedule for Mound
Fiscal Year
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Task AL-MO-1
Subtask AL-MO-1-1
Subtask AL-MO-1-2
Task AL-MO-2
Task AL-MO-3
Subtask AL-MO-3-1
Subtask AL-MO-3-2
Task AL-MO-4
Task AL-MO-5
Subtask AL-MO-5-1
Subtask AL-MO-5-2
RIP
RI
RIR
FS
ROD
RD
RA
FFA/ICA Negotiations
NEPA EA
Legend
Activities underway
Planned start
Planned finish
Uncertain